2012 ANNUAL MONITORING NETWORK PLAN FOR THE NORTH CAROLINA DIVISION OF AIR QUALITY

VOLUME 2

SITE DESCRIPTIONS BY METROPOLITAN STATISTICAL AREA

G. THE WILMINGTON MONITORING REGION

July 2, 2012

North Carolina Division of Air Quality
A Division of the North Carolina Department
of Environment and Natural Resources
Mail Service Center 1641
Raleigh, North Carolina 27699-1641

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G. The Wilmington Monitoring Region

The Wilmington Monitoring Region, shown in Figure G1, consists of three sections: (1) the Wilmington Metropolitan Statistical Area (MSA) (Brunswick, New Hanover, and Pender Counties), (2) the Jacksonville MSA (Onslow County), and (3) the Non-MSA Portion of the Wilmington Monitoring Region (Carteret, Columbus, and Duplin Counties).

Figure G1. The Wilmington Monitoring Region
The red dots show the approximate locations of most of the monitoring sites in this region.

(1) The Wilmington MSA

The Wilmington MSA consists of three counties: Brunswick, New Hanover, and Pender. The major metropolitan area is the City of Wilmington. The North Carolina Division of Air Quality (NC-DAQ) currently operates two criteria pollutant monitoring sites and one urban air toxics monitoring site in the Wilmington MSA. The criteria pollutant monitoring sites are the New Hanover site and the Castle Hayne site. The urban air toxics monitoring site is the Battleship site.

Figure G2. Castle Hayne Ozone and Fine Particle Monitoring Site (37-129-0002)

At the **Castle Hayne** (37-129-0002) site the NC-DAQ operates an ozone monitor, a one-in-three day fine particle monitor, and a continuous fine particle monitor. Monitoring information for the site is summarized in Table G1. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west, and northwest are provided in Figure G2 through Figure G10. The NC-DAQ completed the Beta Attenuation Monitor (BAM) study in December 2011. At that time the BAM was shut down and the 1-in-3 day fine particle Federal Reference Method (FRM) monitor became a SLAMS.

Table G1. Site Table for Castle Hayne

Site Name:	Castle Hayne			**AQS Site Identification Number:**	37-129-0002
Location:	6028 Holly Shelter Road, Castle Hayne, North Carolina				
MSA:	Wilmington,NC			**MSA #:**	9200
Latitude	34.364167	**Longitude**	-77.838611	**Datum:**	WGS84
Elevation	12 meters				

Parameter Name	**Method**	**Method Reference ID**	**Sample Duration**	**Sampling Schedule**
Ozone	Instrumental With Ultra Violet Photometry (047)	EQOA-0880-047	1-Hour	April 1 to October 31
PM 2.5 Local Conditions	R & P Model 2025 PM2.5 Sequential w/WINS – Gravimetric Analysis (118)	RFPS-0498-118	24-Hour	Every Third Day, Year Round
PM2.5 Raw Data/ Acceptable PM2.5 AQI & Speciation	PM2.5 TEOM w/VSCC w/No Correction Factor (716)/(717) PM2.5 TEOM w/VSCC w/Correction Factor	Not a Reference Method	1-Hour	Year Round

Date Monitor Established:	Ozone	January 1, 1979
Date Monitor Established:	PM 2.5 Local Conditions	July 1, 2002
Date Monitor Established:	PM2.5 Raw Data/Acceptable PM2.5 AQI & Speciation	January 1, 2006

Nearest Road:	Holly Shelter Road	**Traffic Count:**	2400	**Year of Count:**	2009

Parameter Name	**Distance to Road**	**Direction to Road**	**Monitor Type**	**Statement of Purpose**
Ozone	60	North	SLAMS	Real-time AQI reporting. Compliance w/NAAQS.
PM 2.5 Local Conditions	60	North	SLAMS	AQI reporting. Compliance w/NAAQS.
PM2.5 Raw Data/ Acceptable PM2.5 AQI & Speciation	60	North	Non-Regulatory	Real-time AQI reporting.

Parameter Name	**Monitoring Objective**	**Scale**	**Suitable for Comparison to NAAQS**	**Proposal to Move or Change**
Ozone	Population Exposure	Urban	Yes	None
PM 2.5 Local Conditions	Population Exposure	Neighborhood	Yes	None
PM2.5 Raw Data/ Acceptable PM2.5 AQI & Speciation	Population Exposure	Neighborhood	No	None

Parameter Name	**Meets Part 58 Appendix A Requirements**	**Meets Part 58 Appendix C Requirements**	**Meets Part 58 Appendix D Requirements**	**Meets Part 58 Appendix E Requirements**
Ozone	Yes	Yes	Yes	Yes
PM 2.5 Local Conditions	Yes	Yes	No requirements	Yes
PM2.5 Raw Data/ Acceptable PM2.5 AQI & Speciation	Yes	No/not required to	No requirements	Yes

Parameter Name	**Probe Height (m)**	**Distance to Support**	**Distance to Trees**	**Obstacles**
Ozone	3.8	1 meter	>20 meters	None
PM 2.5 Local Conditions	2.3	> 2 meters	>20 meters	None
PM2.5 Raw Data/ Acceptable PM2.5 AQI & Speciation	2.3	> 2 meters	>20 meters	None

Figure G3 Looking North from the Castle Hayne Site

Figure G4. Looking Northwest from the Castle Hayne Site

Figure G5. Looking West from the Castle Hayne Site

Figure G6. Looking Southwest from the Castle Hayne Site

Figure G7. Looking Northeast from the Castle Hayne Site

Figure G8. Looking East from the Castle Hayne Site

Figure G9. Looking Southeast from the Castle Hayne Site

Figure G10. Looking South from the Castle Hayne Site

The NC-DAQ continues to follow the progress of the Titan cement facility closely. If Titan is constructed, the NC-DAQ will reassess the site after Titan begins operation to ensure the site continues to meet siting criteria for the purposes of the monitors located at the site.

According to the 2010 census, the population of the Wilmington MSA crossed 350,000, requiring a second ozone monitor for the MSA if the ozone design value is above 85 % of the National Ambient Air Quality Standards. The design value for 2009-2011 for Wilmington is at 83 % of the standard so a second ozone monitor is not needed at this time. In addition, the NC-DAQ received a waiver for a second ozone monitor for the MSA from the EPA on November 9, 2011. The waiver is valid until the next 5-year assessment is due in 2015. The waiver is shown in Figure G14.

At the **New Hanover** (37-129-0006) site the NC-DAQ operates a sulfur dioxide monitor. At the beginning of 2012 the shelter was moved approximately 200 feet across the field to maintain access to the site after the host facility closed. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west, and northwest are provided in Figure G11 through Figure G20.

Figure G11. New Hanover Sulfur Dioxide Monitoring Site (37-129-0006)

Figure G12. Looking North from the New Hanover Site

Figure G13. Looking Northeast from the New Hanover Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

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Ms. Shelia Holman
Director
Division of Air Quality
North Carolina Department of
Environment and Natural Resources
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Ms. Holman:

In a December 21, 2010, letter to you, the U.S. Environmental Protection Agency approved a waiver of the requirement that the state operate two ozone monitors in the Wilmington Metropolitan Statistical Area (MSA). At that time, EPA stated that it would re-evaluate the appropriateness of the waiver once EPA completed its reconsideration of the Ozone National Ambient Air Quality Standard (NAAQS).

On September 22, 2011, the Agency completed its reconsideration of the Ozone NAAQS and announced that the NAAQS would not change. This action left the Ozone NAAQS, which was promulgated in 2008, at a level of 0.075 parts per million (ppm).

Because the Wilmington MSA has a low risk for exceeding the 0.075 ppm NAAQS due to ambient air ozone concentrations which have been trending lower (i.e., decreasing design value), sea breezes, attainment status, and a population total that is only slightly over the threshold requirement for a second ozone monitor, EPA believes that the waiver of the second monitor is appropriate. The waiver is in effect until the next 5-year network assessment is completed and approved in 2015.

If you have any questions relating to this matter, please contact Katherine Snyder of my staff at (404) 562-9840.

Sincerely,

Gwendolyn Keyes Fleming
Regional Administrator

cc: Archie Lee, SESD

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Figure G14. Letter from the EPA approving a waiver for a second ozone monitor for the Wilmington MSA

Figure G15. Looking Northwest from the New Hanover Site

Figure G16. Looking West from the New Hanover Site

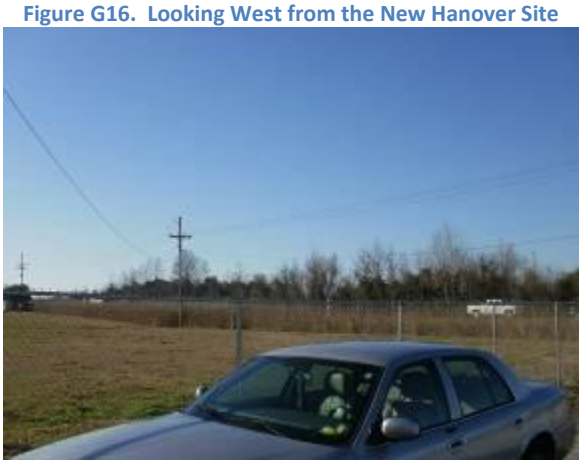

Figure G17. Looking Southwest from the New Hanover Site

Figure G18. Looking East from the New Hanover Site

Figure G19. Looking Southeast from the New Hanover Site

Figure G20. Looking South from the New Hanover Site

The New Hanover site was established in 1994 to replace the Acme-Delco site in Columbus County, which was shut down in 1995. The Acme-Delco site was located about 15 miles west of the New Hanover site. The site was moved because industrial emissions had decreased in Columbus County and the measured sulfur dioxide concentrations had dropped over the previous 10 years. During the time when both monitors operated, the New Hanover site consistently measured higher concentrations of

sulfur dioxide. On January 1, 2013, the New Hanover site will become the required Population Weighted Emission Inventory site for the Wilmington MSA.

Figure G21. The Battle Ship Urban Air Toxics Monitoring Site

At the **Battle Ship** (37-129-0010) site the NC-DAQ operates a year round air toxics volatile organic compound sampler. Samples are collected in stainless steel canisters and sent to the Toxics Protection Branch laboratory where they are analyzed for 68 compounds using the Compendium Method for Toxic Organics 15. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west, and northwest are provided in Figure G21 through Figure G29.

Figure G22. Looking North from the Battleship Site

Figure G23. Looking Northwest from the Battleship Site

Figure G24. Looking Northeast from the Battleship Site

Figure G25. Looking East from the Battleship Site

Figure G26. Looking West from the Battleship Site

Figure G28. Looking Southeast from the Battleship Site

Figure G27. Looking Southwest from the Battleship Site

Figure G29. Looking South from the Battleship Site

In 2008 EPA expanded the **lead monitoring** network to support the lower lead National Ambient Air Quality Standard (NAAQS) of 0.15 micrograms per cubic meter promulgated in 2008. The 2010 changes to the lead monitoring requirements focuses monitoring efforts on fence line monitoring located at facilities that emit 0.5 tons or more of lead per year and at National Core (NCore) monitoring sites. These changes to the lead monitoring network requirements do not affect the Wilmington MSA. The MSA does not have an NCore monitoring site and it does not have any permitted facilities located within its bounds that emit more than 0.5 tons per year of lead.[1]

Any changes to **ozone monitoring** requirements will not affect the Wilmington MSA because it already has an ozone monitor for urban population exposure monitoring and does not have any Class I Areas. However, if the ozone standard is lowered, the design value for Wilmington may exceed the 85 % of the NAAQS threshold which would require a second ozone monitor for the MSA in 2016.

The Wilmington MSA is not affected by the 2010 **nitrogen dioxide monitoring** requirements. It is too small to require area-wide monitors and does not have any roadways with average annual daily traffic above the threshold for near roadway monitoring. The Wilmington MSA will not be affected by the 2010 **sulfur dioxide monitoring** requirements. The existing sulfur dioxide monitor at the New Hanover site will meet the Population Weighted Emission Index monitoring requirements for the MSA. This MSA

[1] Data obtained from the NC-DAQ emission inventory database.

will also not be affected by the **changes to the carbon dioxide monitoring** requirements because the population is too small.

(2) The Jacksonville MSA

The Jacksonville MSA consists of Onslow County. The principal city is Jacksonville. The NC-DAQ currently does not operate any monitoring sites in the Jacksonville MSA. The Jacksonville particle-monitoring site was shut down on December 31, 2007, because the measured concentrations were less than 80 % of the National Ambient Air Quality Standards.

Changes to the **lead monitoring network** requirements in 2010 did not affect the Jacksonville MSA. Although the MSA does not have an NCore monitoring site, it had a permitted facility located within its bounds that emitted 0.5 tons or more per year of lead in 2009. However, lead emissions at Camp LeJeune in 2010 were below the 0.5 ton threshold. The EPA concurred that actual emissions from Camp LeJeune were less than 0.5 tons and did not require monitoring at the fence line of the facility.

Changes to the **ozone monitoring requirements** could affect the Jacksonville MSA if the EPA decides to require monitoring in urban areas without design values. Its population is above the threshold for requiring population exposure monitoring in urban areas but monitoring is not required because it does not have an ozone design value. Currently, the NC-DAQ does not monitor for ozone in Jacksonville because the ozone levels measured by the Castle Hayne monitor in New Hanover County indicate that the ozone concentrations on the coast are currently around 85 % of the NAAQS. The Jacksonville MSA would not be affected by rural ozone monitoring requirements because there are no Class I areas in the MSA.

The Jacksonville MSA is not impacted by the 2010 **nitrogen dioxide monitoring** requirements. It is too small to require area-wide monitors and does not have any roadways with average annual daily traffic above the threshold for near roadway monitoring. The Jacksonville MSA is also not impacted by the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of sulfur dioxide in the MSA and the population is not large enough to require a PWEI monitor. This MSA will also not be impacted by the **proposed changes to the carbon dioxide monitoring requirements** because the population is too small.

(3) The Non-MSA Portion of the Wilmington Monitoring Region

The Non-MSA Portion of the Wilmington Monitoring Region consists of three counties (Carteret, Columbus, and Duplin). This area does not have any MSAs; however, Carteret County is part of the New Bern Micropolitan Statistical Area. The NC-DAQ currently operates one monitoring site in this area at Kenansville shown in Figure 30.

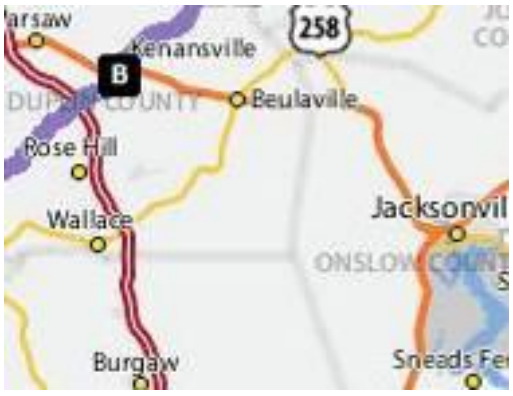

Figure 30. Monitoring Site Location

B is the Kenansville particle site. The neighborhood scale (0.5 to 4 Km) is approximately represented by the black square.

At the **Kenansville** general-background monitoring site in Duplin County the NC-DAQ operates a one-in-three day fine particle FRM monitor, a continuous fine particle beta attenuation monitor (BAM), and a rotating one-in-six day high volume PM_{10} monitor that operates every third year. Late in 2012 or early 2013, the FRM monitor may be shut down and replaced by the BAM, if the BAM and FRM values agree well. A picture of the site as well as views looking north, northeast, east, southeast, south, southwest, west, and northwest are provided in Figure G31 through Figure G39.

Figure G31. Kenansville Particle Monitoring Site

Figure G32. Looking North from the Kenansville Site

Figure G34. Looking Northeast from the Kenansville Site

Figure G33. Looking Northwest from the Kenansville Site

Figure G35. Looking East from the Kenansville Site

Figure G36. Looking West from the Kenansville Site

Figure G38. Looking Southeast from the Kenansville Site

Figure G37. Looking Southwest from the Kenansville Site

Figure G39. Looking South from the Kenansville Site

The NC-DAQ requires PM_{10} data in the coastal area for prevention of significant deterioration (PSD) modeling for industrial expansion. Because the NC-DAQ shut down the PM_{10} monitoring site in Jacksonville on December 31, 2007, the NC-DAQ began manual one-in-six day PM_{10} monitoring at the Castle Hayne site in February 2008 to provide the necessary PM_{10} data for PSD modeling for the coastal area. However, a wildfire next to the site forced the NC-DAQ to shut down the monitor on March 31, 2008. After the wildfire was extinguished, the NC-DAQ decided not to resume PM_{10} monitoring at Castle Hayne because of the pending construction of the Titan Cement Facility across the street from the Castle Hayne site. Modeling results indicate that Titan could contribute over 10 % of the NAAQS to the PM_{10} concentrations measured at Castle Hayne, making Castle Hayne an unsuitable site for obtaining data to use for PSD modeling. As a result the PM_{10} monitor was located at Kenansville in second quarter 2009. At the end of 2010, the NC-DAQ began operating the monitor on a one-in-three year schedule and made the site one of six rotating background PM_{10} sites for the state.

The 2010 **lead monitoring** requirements did not affect this area because there are no NCore monitoring stations or permitted facilities that emit 0.5 tons or more of lead per year located here.[2] Any new **ozone monitoring** requirements should also not affect this area. There is no MSA here so population exposure monitoring requirements for urban areas do not apply and rural ozone monitoring requirements will not apply because there are no Class I areas here. The 2010 **nitrogen dioxide** monitoring requirements also do not affect this area. It is too small to require area-wide monitors and does not have roadways with average annual daily traffic above the threshold for near road monitoring. This area will also not be affected by the 2010 **sulfur dioxide monitoring** requirements because there are no large sources of

[2] *ibid*.

sulfur dioxide in this area and the population is too small to require a PWEI monitor. The changes to the **carbon dioxide monitoring** requirements will not impact this area because the population is too small.

Appendix G.1 Annual Network Site Review Forms for 2011

Castle Hayne

New Hanover in Wilmington

Battle Ship in Wilmington (No 2011 Site Review Conducted)

Kenansville

Site Review Form Calendar Year 2011

Site Information

Region WIRO	**Site Name** Castle Hayne	**AQS Site #** 37- 129 - 0002
Street Address Holly Shelter Road		**City** Castle Hayne
Urban Area Not in an Urban Area	**Core-based Statistical Area** Wilmington, NC	

Enter Exact		**Method of Measuring**	
Longitude 77.8388694	**Latitude** 34.36434722		
In Decimal Degrees	In Decimal Degrees	**Other (explain)**	**Explanation:** Google Earth

Elevation Above/below Mean Sea Level (in meters) 8

Name of nearest road to inlet probe Holly Shelter Road ADT 2400 Year latest available 2009

Comments:

Distance of site to nearest major road (m) 60.00 Direction from site to nearest major road N

Name of nearest major road Holly Shelter Road ADT 2400 Year latest available 2009

Comments:

Site located near electrical substation/high voltage power lines? Yes ☐

Distance of site to nearest railroad track	(m) ____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) 130 Direction NE

Distance between site and drip line of water tower (m) ____ Direction from site to water tower ____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

tt100tthtt

ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☐ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☒ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☐ General/Background ☐ Highest Concentration ☐ Max O3 Concentration ☒ Population Exposure ☐ Source Oriented ☐ Transport ☐ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☒ Urban ☐ Regional	☒ SLAMS Ozone ☐ NCORE ☐ SPM ☐ SPM/OPN ☐ NONREGULATORY

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 3.8

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from probe to supporting structure (meters) 1.0

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) ____ Direction from probe to tree ___

*Height of tree (m) ____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ___ Distance from probe inlet (m) ____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 59 Direction from probe to nearest traffic lane N

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ CO (Micro Only)	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____	☐ SLAMS _____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 2.5 - 3.5 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet to nearest intersection > 10 m? Yes ☐ No ☐
Distance of probe inlet to nearest traffic lane 2 - 10 m? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts_____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ NCORE_____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_2 (Near Road only) ☐ CO (Near Road only)	☐ Highest Concentration____ ☐ Population Exposure____ ☐ Source Oriented____ ☐ Transport_____ ☐ Welfare Related Impacts	☐ Micro_____	☐ SLAMS _____ ☐ SPM_____ ☐ NONREGULATORY ____

Probe inlet height (from ground) 2-15 m? Yes ☐ No ☐ Give actual measured height from ground (meters) ____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ NCORE_____ ☐ SPM_____ ☐ NONREGULATORY _____

Probe inlet height (from ground) ☐ < 2 m ____ ☐ 2-7m ____ ☐ 7-15 m ____ ☐ > 15 m____

Actual measured distance from probe inlet to ground (meters) ____

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance between collocated PM-10, TSP or Pb sampler inlets = 2 to 4 m? Yes ☐ No ☐ NA ☐

Actual measured distance between collocated probes (meters) ____

Distance between any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 ☐ PM10 ☐ PM10-2.5 ☐ PM10 Lead (PB) ☒ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background ☐ Highest Concentration ☒ Population Exposure ☐ Source Oriented ☐ Transport ☐ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☒ Neighborhood ☐ Urban ☐ Regional	☒ SLAMS PM2.5 ☐ NCORE ☐ SPM ☒ NONREGULATORY TEOM

Probe inlet height (from ground) ☐ < 2 m ____ ☒ 2-7m ____ ☐ 7-15 m ____ ☐ > 15 m____
Actual measured distance from probe inlet to ground (meters) 2.3

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☒ No ☐

Distance between inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater?	Yes ☒ No ☐ NA ☐
Distance between all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater?	Yes ☐ No ☐ NA ☒
Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site?	*Yes ☒ (answer *'d questions) No ☐ NA ☐
*Distance between collocated PM 2.5 sampler inlets = 1 to 4 m?	Yes ☐ No ☒ Give actual (meters) 5.2
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☒ No ☐ Give actual (meters) ____
Is an URG 3000 monitor collocated with a SASS monitor at the site?	*Yes ☐ (answer *'d questions) No ☐ NA ☒
* Distance between collocated speciation sampler inlets = 1 to 4 m?	Yes ☐ No ☐ Give actual (meters) ____
* Are collocated speciation sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐ Give actual (meters) ____
Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5?	*Yes ☐ (answer *'d questions) No ☐ NA ☒
*Distance between collocated PM10 and PM2.5 inlets for PM10-2.5 samplers = 1 to 4 m?	Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☒ No ☐

Distance of probe to nearest traffic lane (m) 60 Direction from probe to nearest traffic lane N

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)
*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒
*3) Change scale of representativeness? Yes ☐ (enter new scale _____) No ☒
*4) Relocate site? Yes ☐ No ☒

Comments: _____

Reviewer Tony Sabetti Date December 28, 2011

Ambient Monitoring Coordinator Tony Sabetti Date December 28, 2011

Revised 2012-01-19

Site Review Form Calendar Year 2011

Site Information

Region WIRO	**Site Name** New Hanover	**AQS Site #** 37- 129 - 0006
Street Address- 2400 Hwy 421 North		**City** Wilmington
Urban Area Not in an Urban Area	**Core-based Statistical Area** Wilmington, NC	

Enter Exact		
Longitude 77.95663888	**Latitude** 34.26955555	**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	**GPS** **Explanation:**
Elevation Above/below Mean Sea Level (in meters)		2

Name of nearest road to inlet probe US Highway 421 ADT 21000 Year latest available2009

Comments:

Distance of site to nearest major road (m) 51.00 Direction from site to nearest major road W

Name of nearest major road ADT Year

Comments:

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track (m) 185 Direction to RR E ☐NA

Distance of site to nearest power pole w/transformer (m) 41 Direction W

Distance between site and drip line of water tower (m) Direction from site to water tower ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

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ANSWER ALL APPLICABLE QUESTIONS

Parameters	Monitoring Objective	Scale	Site Type
☐NA ☒ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☐ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☐General/Background ☒Highest Concentration ☐Max O3 Concentration ☐Population Exposure ☐Source Oriented ☐Transport ☐Upwind Background ☐Welfare Related Impacts	☐Micro ☐Middle ☒Neighborhood ☐Urban ☐Regional	☒SLAMS ☐NCORE ☐SPM ☐SPM/OPN ☐NONREGULATORY

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) 4

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from probe to supporting structure (meters) 1.2

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) Direction from probe to tree

*Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle Distance from probe inlet (m) Direction from probe inlet to obstacle

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 51 Direction from probe to nearest traffic lane W

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ CO (Micro Only)	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____	☐ SLAMS _____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 2.5 - 3.5 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet to nearest intersection > 10 m? Yes ☐ No ☐
Distance of probe inlet to nearest traffic lane 2 - 10 m? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ NCORE_____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_2 (Near Road only) ☐ CO (Near Road only)	☐ Highest Concentration____ ☐ Population Exposure____ ☐ Source Oriented____ ☐ Transport____ ☐ Welfare Related Impacts	☐ Micro____	☐ SLAMS ____ ☐ SPM____ ☐ NONREGULATORY ____

Probe inlet height (from ground) 2-15 m? Yes ☐ No ☐ Give actual measured height from ground (meters) ____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ Pb	☐ Highest Concentration____ ☐ Population Exposure____ ☐ Source Oriented____ ☐ Background____ ☐ Transport____ ☐ Welfare Related Impacts ____	☐ Micro____ ☐ Middle____ ☐ Neighborhood____ ☐ Urban____ ☐ Regional____	☐ SLAMS ____ ☐ NCORE____ ☐ SPM____ ☐ NONREGULATORY ____

Probe inlet height (from ground) ☐ < 2 m ____ ☐ 2-7m ____ ☐ 7-15 m ____ ☐ > 15 m____

Actual measured distance from probe inlet to ground (meters) ____

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance between collocated PM-10, TSP or Pb sampler inlets = 2 to 4 m? Yes ☐ No ☐ NA ☐

Actual measured distance between collocated probes (meters) ____

Distance between any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA Air flow < 200 L/min ☐ PM2.5 ☐ PM10 ☐ PM10-2.5 ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background____ ☐ Highest Concentration____ ☐ Population Exposure____ ☐ Source Oriented____ ☐ Transport_____ ☐ Upwind Background____ ☐ Welfare Related Impacts ____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood____ ☐ Urban_____ ☐ Regional____	☐ SLAMS _____ ☐ NCORE____ ☐ SPM_____ ☐ NONREGULATORY _____

Probe inlet height (from ground) ☐ < 2 m ____ ☐ 2-7m ____ ☐ 7-15 m ____ ☐ > 15 m____
Actual measured distance from probe inlet to ground (meters) ____

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☐ No ☐____

Distance between inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater?	Yes ☐ No ☐ NA ☐
Distance between all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater?	Yes ☐ No ☐ NA ☐
Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site?	*Yes ☐ (answer *'d questions) No ☐ NA ☐
*Distance between collocated PM 2.5 sampler inlets = 1 to 4 m?	Yes ☐ No ☐ Give actual (meters) ____
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐ Give actual (meters) ____
Is an URG 3000 monitor collocated with a SASS monitor at the site?	*Yes ☐ (answer *'d questions) No ☐ NA ☐
* Distance between collocated speciation sampler inlets = 1 to 4 m?	Yes ☐ No ☐ Give actual (meters) ____
* Are collocated speciation sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐ Give actual (meters) ____
Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5?	*Yes ☐ (answer *'d questions) No ☐ NA ☐
*Distance between collocated PM10 and PM2.5 inlets for PM10-2.5 samplers = 1 to 4 m?	Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other?	Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

RECOMMENDATIONS:

1) Maintain current site status? Yes ☐ *No ☒ (answer *'d questions)
*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-
*3) Change scale of representativeness? Yes ☐ (enter new scale _____) No ☐
*4) Relocate site? Yes ☐ No ☐

Comments: Change Monitoring Objective to Maximum Concentration

Reviewer Tony Sabetti Date1/19/2012

Ambient Monitoring Coordinator Tony Sabetti Date1/19/2012

Revised 2012-01-19

Site Review Form Calendar Year 2011

Site Information

Region WIRO	**Site Name** Kenansville	**AQS Site #** 37- 61 - 0002
Street Address 328 Limestone Road		**City** Kenansville
Urban Area Not in an Urban Area	**Core-based Statistical Area** None	

Enter Exact		Method of Measuring	
Longitude 77.960744	**Latitude** 34.954800		
In Decimal Degrees	In Decimal Degrees	**Other (explain)**	**Explanation: Google Erth**

Elevation Above/below Mean Sea Level (in meters) **40**

Name of nearest road to inlet probe Limestone Road ADT 3400 Year latest available 2010

Comments: _____

Distance of site to nearest major road (m) _____ Direction from site to nearest major road ___

Name of nearest major road Kenansville Bypass (Hwy 24/903) ADT 7800 Year latest available 2010

Comments: _____

Site located near electrical substation/high voltage power lines? Yes ☒ No ☐

Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) 190 Direction N

Distance between site and drip line of water tower (m) _____ Direction from site to water tower _____ ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

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ANSWER ALL APPLICABLE QUESTIONS:

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ SO_2 (NAAQS) ☐ SO_2 (trace-level) ☐ NO_x (NAAQS) ☐ $HSNO_y$ ☐ O_3 ☐ NH_3 ☐ Hydrocarbon ☐ Air Toxics ☐ HSCO (Not Micro) ☐ CO (trace-level)	☐ General/Background ☐ Highest Concentration ☐ Max O3 Concentration ☐ Population Exposure ☐ Source Oriented ☐ Transport ☐ Upwind Background ☐ Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☐ Urban ☐ Regional	☐ SLAMS ☐ NCORE ☐ SPM ☐ SPM/OPN ☐ NONREGULATORY

Probe inlet height (from ground) 2-15 m? Yes ☐ No ☐ Give actual measured height from ground (meters) ____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ CO (Micro Only)	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____	☐ SLAMS _____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 2.5 - 3.5 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet to nearest intersection > 10 m? Yes ☐ No ☐
Distance of probe inlet to nearest traffic lane 2 - 10 m? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ NCORE_____ ☐ SPM_____ ☐ SPM/OPN_____ ☐ NONREGULATORY

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☐
Actual measured distance from probe inlet to ground (meters) _____

Distance of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☐ No ☐
Actual measured distance from probe to supporting structure (meters) _____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☒ NA ☐ NO_2 (Near Road only) ☐ CO (Near Road only)	☐ Highest Concentration____ ☐ Population Exposure____ ☐ Source Oriented____ ☐ Transport_____ ☐ Welfare Related Impacts	☐ Micro_____	☐ SLAMS _____ ☐ SPM_____ ☐ NONREGULATORY ____

Probe inlet height (from ground) 2-15 m? Yes ☐ No ☐ Give actual measured height from ground (meters) ____

Distance of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance of probe inlet from other monitoring probe inlets > 1 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Parameters	Monitoring Objective	Scale	Site Type
☒ NA Air flow > 200 L/min ☐ PM10 ☐ TSP ☐ Pb	☐ Highest Concentration_____ ☐ Population Exposure_____ ☐ Source Oriented_____ ☐ Background_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☐ Neighborhood_____ ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ NCORE_____ ☐ SPM_____ ☐ NONREGULATORY _____

Probe inlet height (from ground) ☐ < 2 m ____ ☐ 2-7m ____ ☐ 7-15 m ____ ☐ > 15 m____

Actual measured distance from probe inlet to ground (meters) ____

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☐ No ☐

Actual measured distance from probe to supporting structure (meters) ____

Distance between collocated PM-10, TSP or Pb sampler inlets = 2 to 4 m? Yes ☐ No ☐ NA ☐

Actual measured distance between collocated probes (meters) ____

Distance between any high volume inlet and any other high or low volume inlet ≥ 2 m? Yes ☐ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☐ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___
*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☐

*Identify obstacle ____ Distance from probe inlet (m) ____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) _____ Direction from probe to nearest traffic lane ___

Site Review Form Calendar Year 2011

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 ☐ PM10 ☐ PM10-2.5 ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☐ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☒ General/Background ☐ Highest Concentration ☐ Population Exposure ☐ Source Oriented ☐ Transport ☐ Upwind Background ☒ Welfare Related Impacts	☐ Micro ☐ Middle ☐ Neighborhood ☐ Urban ☒ Regional	☒ SLAMS ☐ NCORE ☐ SPM ☐ NONREGULATORY

Probe inlet height (from ground) ☐ < 2 m ☒ 2-7m ☐ 7-15 m ☐ > 15 m
Actual measured distance from probe inlet to ground (meters) 2.4

Distance of inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☒ No ☐

Distance between inlets of any low volume monitor and any other low volume monitor at the site = 1 m or greater? Yes ☐ No ☐ NA ☒

Distance between all low volume monitor inlets and any Hi-Volume PM-10 or TSP inlet = 2 m or greater? Yes ☐ No ☐ NA ☒

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, FRM & TEOM, BAM & TEOM) Located at Site? *Yes ☐ (answer *'d questions) No ☐ NA ☒

*Distance between collocated PM 2.5 sampler inlets = 1 to 4 m? Yes ☐ No ☐ Give actual (meters) ____

*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) ____

Is an URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated speciation sampler inlets = 1 to 4 m? Yes ☐ No ☐ Give actual (meters) ____

* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☐ No ☐ Give actual (meters) ____

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☐ NA ☒

*Distance between collocated PM10 and PM2.5 inlets for PM10-2.5 samplers = 1 to 4 m? Yes ☐ No ☐

*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line if tree acts as an obstruction? Yes ☐ *No ☐

*Distance from probe to tree (m) _____ Direction from probe to tree ___

*Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ___ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☒ No ☐

Distance of probe to nearest traffic lane (m) 375 Direction from probe to nearest traffic lane ENE

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☒

*3) Change scale of representativeness? Yes ☐ (enter new scale _____) No ☒

*4) Relocate site? Yes ☐ No ☒

Comments: _____

Reviewer Tony Sabetti Date December 28, 2011

Ambient Monitoring Coordinator Tony Sabetti Date 12/28/2011

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Appendix G-2. Scale of Representativeness

Each station in the monitoring network must be described in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

a) Microscale - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

b) Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

c) Neighborhood scale – defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers.

d) Urban scale - defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.

e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Closely associated with the area around the monitoring station where pollutant concentrations are reasonably similar are the basic monitoring exposures of the station.

There are six basic exposures:

a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.

b) Sites located to determine representative concentrations in areas of high population density.

c) Sites located to determine the impact on ambient pollution levels of significant sources or source categories.

d) Sites located to determine general background concentration levels.

e) Sites located to determine the extent of regional pollutant transport among populated areas.

f) Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts and in support of secondary standards.

The design intent in siting stations is to correctly match the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the station. The following relationship of the six basic objectives and the scales of representativeness are appropriate when siting monitoring stations:

Table 2. Site Type Appropriate Siting Scales

1. Highest concentration	Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants)
2. Population oriented	Neighborhood, urban
3. Source impact	Micro, middle, neighborhood
4. General/background & regional transport	Urban, regional
5. Welfare-related impacts	Urban, regional